AMENDMENTS TO THE CLAIMS:

Claim 1 (Original) A thermal barrier coating for an underlying metal substrate which comprises a zirconia-containing ceramic composition having a c/a ratio of the zirconia lattice in the range of from about 1.0057 to about 1.0110 and stabilized in the tetragonal phase by a stabilizing amount of a stabilizing metal oxide, the thermal barrier coating having:

1. a fraction of porosity of from about 0.15 to about 0.25; and
2. an impact and erosion resistance property defined by at least one of the following formulas:
   (a) $I = \exp. [5.85 - (144 \times s) - (3.68 \times p)]$;
   (b) $E = [187 - (261 \times p) - (9989 \times s)]$;

wherein $s = 1.0117 - c/a$ ratio; p is the fraction of porosity; I is at least about 70 g/mil; and E is at least about 80 g/mil.

Claim 2 (Original) The coating of claim 1 which has a strain-tolerant columnar structure.

Claim 3 (Original) The coating of claim 2 wherein the c/a ratio is in the range of from about 1.0069 to about 1.0096.

Claim 4 (Original) The coating of claim 2 wherein the fraction of porosity is from about 0.18 to about 0.20.

Claim 5 (Original) The coating of claim 2 which has an impact and erosion resistance property defined by both of formulas (a) and (b).

Claim 6 (Original) The coating of claim 5 wherein I is at least about 90 g/mil and E is at least about 100 g/mil.

Claim 7 (Original) The coating of claim 2 wherein the stabilizing metal oxide is selected from the group consisting of yttria, calcia, ceria, scandia, magnesia, india, lanthana, gadolinia, neodymia, samaria, dysprosia, erbia, ytterbia, europia, praseodymia, and

mixtures thereof.

Claim 8 (Original) The coating of claim 7 wherein the stabilizing metal oxide is selected from the group consisting of yttria, lanthana, and mixtures thereof.

Claim 9 (Original) The coating of claim 8 wherein the stabilizing metal oxide is yttria.

Claim 10 (Original) A thermally protected article, which comprises:

A. a metal substrate; and

B. a thermal barrier coating which comprises a zirconia-containing ceramic composition having a c/a ratio of the zirconia lattice in the range of from about 1.0057 to about 1.0110 and stabilized in the tetragonal phase by a stabilizing amount of a stabilizing metal oxide, the thermal barrier coating having:

1. a fraction of porosity of from about 0.15 to about 0.25; and
2. an impact and erosion resistance property defined by at least one of the following formulas:

(a) $I = \exp. [5.85 - (144 \times s) - (3.68 \times p)]$;

(b) $E = [187 - (261 \times p) - (9989 \times s)]$;

wherein $s = 1.0117 - c/a$ ratio; p is the fraction of porosity; I is least about 70 g/mil; and E is least about 80 g/mil.

Claim 11 (Original) The article of claim 10 which further comprises a bond coat layer adjacent to and overlaying the metal substrate and wherein the inner layer is adjacent to and overlies the bond coat layer.

Claim 12 (Original) The article of claim 11 wherein the thermal barrier coating has a thickness of from about 1 to about 100 mils.

Claim 13 (Original) The article of claim 12 wherein the thermal barrier coating has a strain-tolerant columnar structure.

Claim 14 (Original) The article of claim 13 wherein the c/a ratio is in the range of from about 1.0069 to about 1.0096.

Claim 15 (Original) The article of claim 13 wherein the fraction of porosity is from about 0.18 to about 0.20.

Claim 16 (Original) The article of claim 13 wherein the thermal barrier coating has an impact and erosion resistance property defined by both of formulas (a) and (b).

Claim 17 (Original) The article of claim 16 wherein I is at least about 90 g/mil and E is at least about 100 g/mil.

Claim 18 (Original) The article of claim 13 wherein the stabilizing metal oxide is selected from the group consisting of yttria, calcia, ceria, scandia, magnesia, india, lanthana, gadolinia, neodymia, samaria, dysprosia, erbia, ytterbia, europia, praseodymia, and mixtures thereof.

Claim 19 (Original) The article of claim 18 wherein the stabilizing metal oxide is selected from the group consisting of yttria, lanthana, and mixtures thereof.

Claim 20 (Original) The coating of claim 19 wherein the stabilizing metal oxide is yttria.

Claim 21 (Original) The article of claim 13 which is a turbine engine component.

Claim 22 (Original) The article of claim 21 which is a turbine shroud and wherein the thermal barrier coating has a thickness of from about 30 to about 70 mils.

Claim 23 (Original) The article of claim 21 which is a turbine airfoil and wherein the thermal barrier coating has a thickness of from about 3 to about 20 mils.

Claim 24 (Original) A method for preparing a thermal barrier coating for an underlying metal substrate, the method comprising the step of:

a. depositing over the metal substrate a zirconia-containing ceramic composition having a c/a ratio of the zirconia lattice in the range of from about 1.0057 to about 1.0110 and stabilized in the tetragonal phase by a stabilizing amount of a stabilizing metal oxide selected from the group consisting of yttria, calcia, ceria, scandia, magnesia, india, lanthana, gadolinia, neodymia, samaria, dysprosia, erbia, ytterbia, europia, praseodymia, and mixtures thereof to form a thermal barrier coating having:

1. a fraction of porosity of from about 0.15 to about 0.25; and
2. an impact and erosion resistance property defined by at least one of the following formulas::

(a) $I = \exp. [5.85 - (144 \times s) - (3.68 \times p)]$;

(b) $E = [187 - (261 \times p) - (9989 \times s)]$;

wherein $s = 1.0117 - c/a$ ratio; p is the fraction of porosity; I is least about 70 g/mil; and E is least about 80 g/mil.

Claim 25 (Original) The method of claim 24 wherein a bond coat layer is adjacent to and overlies the metal substrate and wherein the thermal barrier coating is formed on the bond coat layer.

Claim 26 (Original) The method of claim 25 wherein the zirconia-containing ceramic composition is deposited by physical vapor deposition to form a thermal barrier coating having a strain-tolerant columnar structure.

Claim 27 (Original) The method of claim 26 wherein the thermal barrier coating is formed so as to have an impact and erosion resistance property defined by both of formulas (a) and (b).

Claim 28 (Original) The method of claim 27 wherein the thermal barrier coating is formed to have an impact and erosion resistance property defined by formulas (a) and (b) such that I is at least about 90 g/mil and E is at least about 100 g/mil.

Claim 29 (Original) The method of claim 26 wherein the thermal barrier coating is

formed from a zirconia-containing ceramic composition stabilized with a stabilizing metal oxide selected from the group consisting of yttria, lanthana, and mixtures thereof.

Claim 30 (Original) The method of claim 27 wherein the thermal barrier coating is formed to have a fraction of porosity of from about 0.18 to about 0.20 and is formed from a zirconia-containing ceramic composition stabilized with yttria and having a c/a ratio in the range of from about 1.0069 to about 1.0096.